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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,785	07/25/2005	Linda Lefevre	Serie 6048	4802
7590	12/27/2007		EXAMINER	
Linda K Russell			CHEN, CHRISTINE	
Air Liquide				
Intellectual Property Department			ART UNIT	PAPER NUMBER
Suite 1800 2700 Post Oak Boulevard				
Houston, TX 77056			4116	
			MAIL DATE	DELIVERY MODE
			12/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/511,785	<b>Applicant(s)</b> LEFEVRE ET AL.
	<b>Examiner</b> CHRISTINE CHEN	<b>Art Unit</b> 4116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

1) Responsive to communication(s) filed on 25 July 2005.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

4) Claim(s) 1-29 is/are pending in the application.

4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 15-29 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 15 October 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1668)  
 Paper No(s)/Mail Date 15 October 2004

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Status of Application***

Claims 15-29 are pending and presented for examination. Claims 1-14 were cancelled.

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on October 15, 2004 was filed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Drawings***

1. The drawings are objected to because the drawings are not shown in sequential order. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims 15, 16, 17, 23, and 28 are rejected under 35 U.S.C. 102(a) as being anticipated by Van den Sype (US 2002/0104589 hereinafter A1).

Van den Sype (A1) teaches a process for heat treating components in a heat-treating furnace (p. 1, para. 11). A gas mixture is used, composed of a quenching gas and treating gas (p. 1, para. 14). "The treating gas can be at least one gas selected from the group comprising methane, carbon monoxide, nitrogen, propane, and butane" (p. 2, left hand column, li. 1-3). This overlaps with claims 15 and 23. "The quenching gas could be at least one gas selected from the group consisting of helium, preferably as the major component and from the group consisting of nitrogen, argon and carbon monoxide as the minor component. The preferred quenching gas would be helium (p. 2, left hand column, li. 10-15). This overlaps with claims 16 and 17.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 18-22 and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Sype (US 2002/0104589 hereinafter A1) in view of Wandke (EP1050592 hereinafter A2).

Van den Sype's teaching is mentioned in 102 rejection above.

In regards to claims 18-22, Van den Sype (A1) fails to teach the adjustment of the composition to obtain an average mixture density substantially equal to that of nitrogen, the adjustment of the composition to optimize the mixture's convective heat transfer coefficient, a stirring system within the vessel,.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Van den Sype (A1) with the adjustment of the composition so the mixture density is substantially equal to that of nitrogen. Nitrogen quenching apparati are well known in the art and if the gas mixture was substantially equal to that of nitrogen, the gas mixture can be used in nitrogen quenching apparati. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Van den Sype (A1) with the adjustment of the composition to optimize the mixture's convective heat transfer coefficient, as compared to the individual convective heat transfer coefficient of each component of said mixture because if the coefficient of the combination is not better than that of the individual components, then simply the individual components could and would be used and to use a stirring system to increase circulation of the gas.

In regards to claim 28, Van den Sype (A1) teaches a very similar process of recycling a gas mixture, in which only the recycled gas is recompressed prior to a

subsequent use (p. 2, right hand column, para. 25, li. 26-28). The recycling process involves the separation of the treating gas and quenching gas, He (p. 1, para. 15).

In regards to claim 22, while claim 16 is anticipated by Van den Sype (A1), Van den Sype (A1) fails to teach the use of CO<sub>2</sub> as an absorbing gas. Wandke (A2) however teaches the use of carbon dioxide, an infrared radiation absorbing gas, as a quenching gas for metal heat treatment (abstract).

In regards to claims 24 and 25, while claim 15 is anticipated by Van den Sype (A1), Van den Sype (A1) fails to teach the volume % of the absorbing gas in the mixture. Wandke (A2) however teaches an example in which the absorbing gas is 50% of the total mixture volume (p. 2, para 11, li. 1-3). This overlaps with claims 24 and 25.

In regards to claims 26 and 27, while claim 15 is anticipated by Van den Sype (A1), Van den Sype (A1) fails to teach the volume % of the absorbing gas in the mixture. Wandke (A2) however teaches these combinations with the reactive gas composing up to 50% of the total volume (page 3, claims, claim 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Vanden Sype (A1) with the volume % taught by Wandke (A2) so that a thorough reaction between the components of the gas mixture can take place.

4. In regards to claim 29, Wandke (A2) teaches metal heat treatment comprising quenching (abstract). Wandke (A2) covers the volume percent of the cooling gas of the absorbing gas and the second gas (p. 3, claims, claims 1-3). In addition, it would have been obvious to adjust the composition of said cooling gas so that significant later changes to said apparatus are unnecessary. It would have been obvious to one or

ordinary skill in the art at the time the invention was made to modify Wandke with the adjustment of the composition of said cooling gas in order to increase efficiency in production.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE CHEN whose telephone number is (571)270-3590. The examiner can normally be reached on Monday-Friday 8:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CC

/Vickie Kim/  
Supervisory Patent Examiner, Art Unit 4116